2SB715, 2SB716, 2SB716A

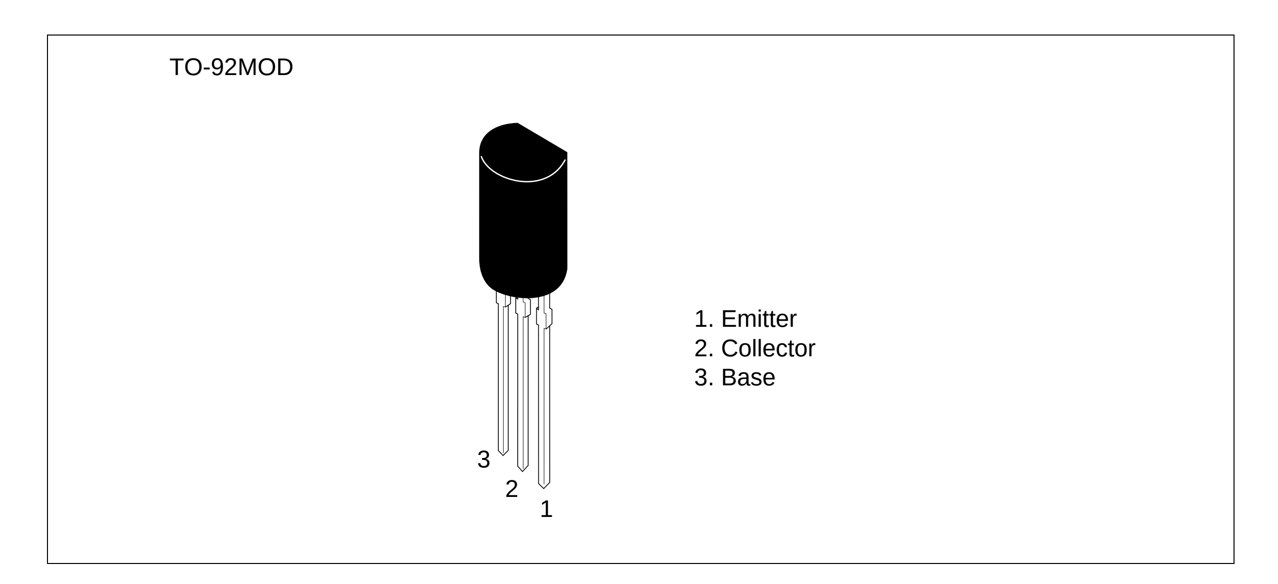
Silicon PNP Epitaxial

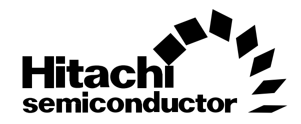
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Application

- Low frequency high voltage amplifier
- Complementary pair with 2SD755, 2SD756 and 2SD756A

Outline





Absolute Maximum Ratings (Ta = 25°C)

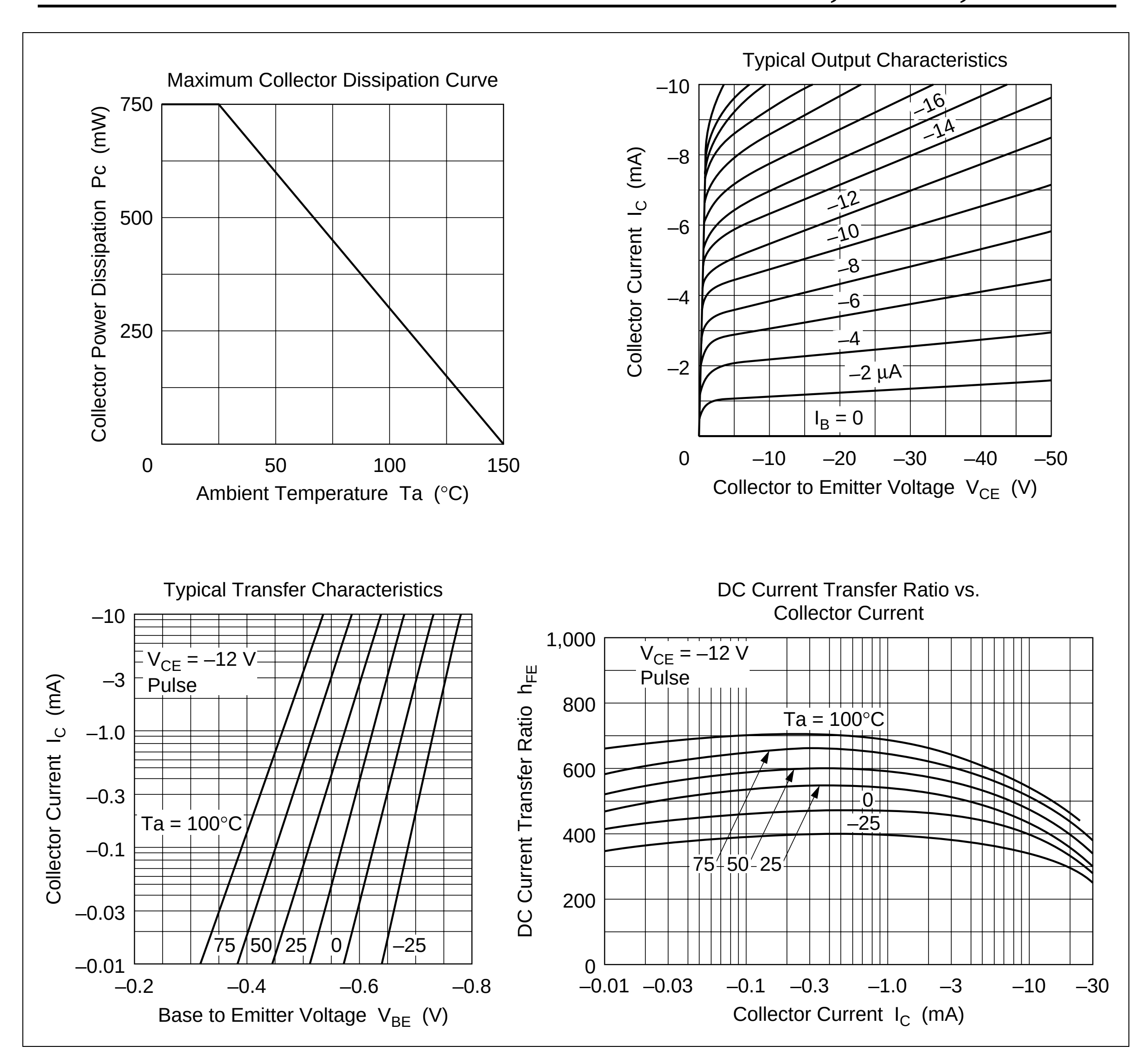
Item	Symbol	2SB715	2SB716	2SB716A	Unit
Collector to base voltage	V_{CBO}	–100	–120	–140	V
Collector to emitter voltage	V_{CEO}	–100	–120	–140	V
Emitter to base voltage	V_{EBO}	–5	–5	–5	V
Collector current	I_C	–50	–50	–50	mA
Collector power dissipation	P_C	750	750	750	mW
Junction temperature	Tj	150	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	–55 to +150	°C

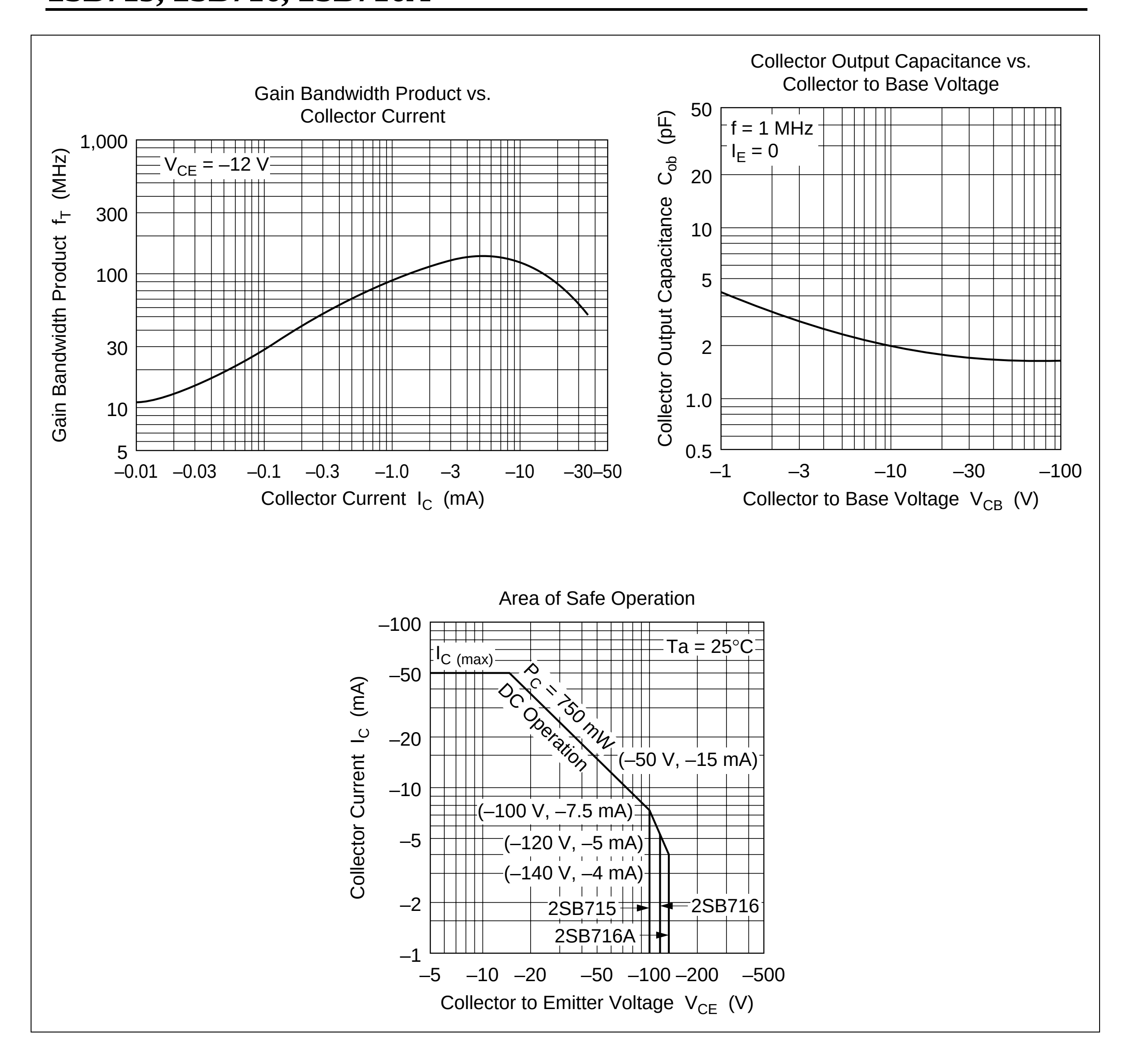
Electrical Characteristics (Ta = 25°C)

		2SB715			2SB716			2SB716A				
Item	Symbol	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	–100	—	—	–120	—	—	–140	—	—	V	I_C = –10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	–100	—	—	–120	—	—	–140	—	—	V	I_C = –1 mA, R_{BE} = ∞
Collector cutoff current	I_{CBO}	—	—	–0.5	—	—	—	—	—	—	µA	V_{CB} = –80 V, I_E = 0
		—	—	—	—	—	–0.5	—	—	–0.5	µA	V_{CB} = –100 V, I_E = 0
DC current transfer ratio	h_{FE1}*1	250	—	800	250	—	800	250	—	500		V_{CE} = –12 V, I_C = –2 mA
	h_{FE2}	125	—	—	125	—	—	125	—	—		V_{CE} = –12 V, I_C = –10 mA
Base to emitter voltage	V_{BE}	—	—	–0.75	—	—	–0.75	—	—	–0.75	V	V_{CE} = –12 V, I_C = –2 mA
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	–0.2	—	—	–0.2	—	—	–0.2	V	I_C = –10 mA, I_B = –1 mA
Gain bandwidth product	f_T	—	150	—	—	150	—	—	150	—	MHz	V_{CE} = –12 V, I_C = –5 mA
Collector output capacitance	Cob	—	1.8	—	—	1.8	—	—	1.8	—	pF	V_{CB} = –25 V, I_E = 0, f = 1 MHz

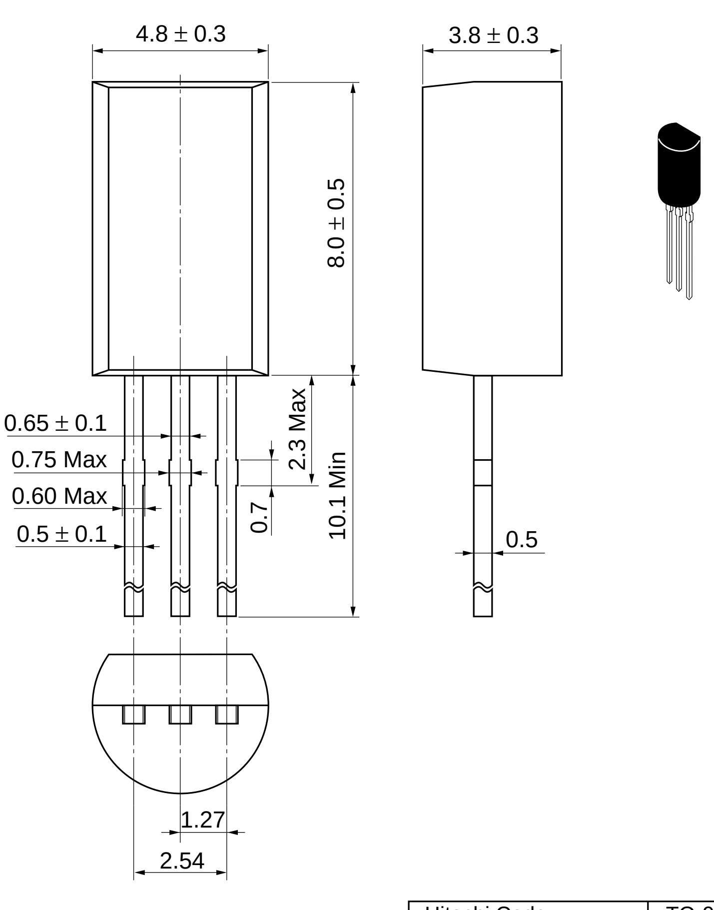
Note: 1. The 2SB715, 2SB716 and 2SB716A are grouped by h_{FE1} as follows.

	D	E
2SB715, 2SB716	250 to 500	400 to 800
2SB716A	250 to 500	—


Maximum Collector Dissipation Curve
Collector Power Dissipation Pc (mW)
750
500
250
0
50
100
150
Ambient Temperature Ta (°C)
Typical Output Characteristics
Collector Current IC (mA)
–10
–8
–6
–4
–2
0
–16
–14
–12
–10
–8
–6
–4
–2 μA
IB = 0
–10
–20
–30
–40
–50
Collector to Emitter Voltage VCE (V)
Typical Transfer Characteristics
Collector Current IC (mA)
–10
–3
–1.0
–0.3
–0.1
–0.03
–0.01
VCE = –12 V
Pulse
Ta = 100°C
75
50
25
0
–25
–0.2
–0.4
–0.6
–0.8
Base to Emitter Voltage VBE (V)
DC Current Transfer Ratio vs.
Collector Current
DC Current Transfer Ratio hFE
1,000
800
600
400
200
0
VCE = –12 V
Pulse
Ta = 100°C
0
–25
75
50
25
–0.01
–0.03
–0.1
–0.3
–1.0
–3
–10
–30
Collector Current IC (mA)


Gain Bandwidth Product vs.
Collector Current
V_{CE} = –12 V
Gain Bandwidth Product f_T (MHz)
1,000
300
100
30
10
5
–0.01
–0.03
–0.1
–0.3
–1.0
–3
–10
–30
–50
Collector Current I_C (mA)
Collector Output Capacitance vs.
Collector to Base Voltage
f = 1 MHz
I_E = 0
Collector Output Capacitance C_{ob} (pF)
50
20
10
5
2
1.0
0.5
–1
–3
–10
–30
–100
Collector to Base Voltage V_{CB} (V)
Area of Safe Operation
$I_{C\ (max)}$
Ta = 25°C
P_C = 750 mW
DC Operation
(–50 V, –15 mA)
(–100 V, –7.5 mA)
(–120 V, –5 mA)
(–140 V, –4 mA)
2SB715
2SB716
2SB716A
Collector Current I_C (mA)
–100
–50
–20
–10
–5
–2
–1
–5
–10
–20
–50
–100
–200
–500
Collector to Emitter Voltage V_{CE} (V)

Unit: mm



Hitachi Code	TO-92 Mod
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.35 g

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